

Presentation 3 The use of sensitivity analysis in the evaluation of dispersion models
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Atmospheric dispersion models are commonly used within a decision making context as part of air quality management at various spatial and temporal scales. The models incorporate parameterisations of important chemical and physical processes as well as modelling assumptions such as turbulent mixing. For confidence to be placed in the model outputs, and therefore decisions based on them, it is important to assess how the uncertainty (or lack of exact knowledge) of the input parameters contributes to predictive output variance.

Combined uncertainty and sensitivity analysis can help to evaluate potential error bars on model predictions, as well as highlighting which parameters contribute most to this output variance. Efforts can then be effectively placed on improving knowledge of these parameters, thereby improving model confidence. Examples will be given for a short range dispersion model which combines a Reynolds Averaged air flow model with a chemically reactive Lagrangian dispersion model.

Applications to short range plume dispersion as well as secondary pollutant formation within an urban street canyon will serve to illustrate the power of the global sensitivity methods used. Freely available software for global sensitivity analysis developed at Leeds will also be shown.